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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.	
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32127	7590 11/21/2003		EXAMINER		
	CORPORATE SERVICE	ROBINSON BOYCE, AKIBA K			
C/O CHRIS'	TIAN R. ANDERSON				
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Please find below and/or attached an Office communication concerning this application or proceeding.

	•	Application No.	Applicant(s)				
Office Action Summary		09/593,118	DREW ET AL.				
		Examiner	Art Unit				
		Akiba K Robinson-Boyce	3623				
Period fo	The MAILING DATE of this communicat r Reply	tion appears on the cover sheet	with the correspondence address				
THE N - Exter after - If the - If NO - Failui - Any r	ORTENED STATUTORY PERIOD FOR MAILING DATE OF THIS COMMUNICA isions of time may be available under the provisions of 37 SIX (6) MONTHS from the mailing date of this communic period for reply specified above is less than thirty (30) day period for reply is specified above, the maximum statutore to reply within the set or extended period for reply will, eply received by the Office later than three months after the dispatch term adjustment. See 37 CFR 1.704(b).	TION. 7 CFR 1.136(a). In no event, however, may ation. ays, a reply within the statutory minimum of the ry period will apply and will expire SIX (6) MO by statute, cause the application to become	a reply be timely filed irty (30) days will be considered timely. DNTHS from the mailing date of this communication. ABANDONED (35 U.S.C. § 133).				
1)⊠	Responsive to communication(s) filed o	n <u>13 June 2000</u> .					
2a) <u></u> □	This action is FINAL . 2b)	☑ This action is non-final.					
3)□	Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under <i>Ex parte Quayle</i> , 1935 C.D. 11, 453 O.G. 213.						
Dispositi	on of Claims						
4) ⊠,	Claim(s) 1-60 is/are pending in the appl	lication.					
	4a) Of the above claim(s) is/are withdrawn from consideration.						
5)[Claim(s) is/are allowed.						
6)⊠	Claim(s) <u>1-60</u> is/are rejected.						
7)	Claim(s) is/are objected to.						
8)[Claim(s) are subject to restriction	n and/or election requirement.					
Applicati	on Papers						
9) 🗌 🤈	The specification is objected to by the E	xaminer.					
10)[The drawing(s) filed on is/are: a)	☐ accepted or b)☐ objected t	by the Examiner.				
	Applicant may not request that any objection	n to the drawing(s) be held in abey	ance. See 37 CFR 1.85(a).				
	Replacement drawing sheet(s) including the	<u>-</u>).			
11)	The oath or declaration is objected to by	the Examiner. Note the attach	ed Office Action or form PTO-152.				
Priority u	ınder 35 U.S.C. §§ 119 and 120						
	Acknowledgment is made of a claim for All b) Some * c) None of: 1. Certified copies of the priority doc 2. Certified copies of the priority doc 3. Copies of the certified copies of the application from the International	cuments have been received. cuments have been received in he priority documents have bee	Application No				
13)	See the attached detailed Office action for checknowledgment is made of a claim for coince a specific reference was included in 7 CFR 1.78. The translation of the foreign languation of the foreign languation of the foreign languation of the foreign languation of the first sentence for the first sentence for the first sentence.	or a list of the certified copies not a list of the certified copies not domestic priority under 35 U.S.C in the first sentence of the specifiage provisional application has domestic priority under 35 U.S.C	 S 119(e) (to a provisional application can be applicated been received. S§ 120 and/or 121 since a specific 	et.			
Attachmen	t(s)						
2) Notic	e of References Cited (PTO-892) se of Draftsperson's Patent Drawing Review (PTO- mation Disclosure Statement(s) (PTO-1449) Paper	-948) 5) Notice o	Summary (PTO-413) Paper No(s) Informal Patent Application (PTO-152)				

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DETAILED ACTION

Status of Claims

1. Due to correspondence filed 9/12/03, the following is a non-final office action.

Claims 1-60 are pending in this application and have been examined on the merits. The previous office action has been withdrawn and the following is rejected under new prior art.

Claim Rejections - 35 USC § 101

2. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claims 1-15 are rejected under 35 U.S.C. 101 because the claimed invention is directed to a non-statutory subject matter.

The basis of this rejection is set forth in a two-prong test of :

- (1) whether the invention is within the technological arts; and
- (2) whether the invention produces a useful, concrete, and tangible result.

For a claimed invention to be statutory, the claimed invention must be within the technological arts. Mere ideas in the abstract (i.e., abstract idea, law of nature, natural phenomena that do not apply, involve, use, or advance the technological arts fail to promote the "progress of science and the useful art" (i.e., the physical sciences as opposed to social sciences, for example) and therefore are found to be non-statutory subject matter. For a process claim, the recited process must somehow apply, involve, use, or advance the technological arts.

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In the present case, claims 1-15 are directed to a method for evaluating customer value to guide loyalty and retention programs. Independent claim 1 recites the steps of "calculating an individual customer's tenure...", "generating a hazard function...", "calculating a gain in lifetime value...", and "determining a focus for a loyalty and retention program...". These steps represent mere ideas in the abstract since they do not involve physical and/or computer means to carry them out. Since no physical and/or computer means are used to carry out the steps of the invention, independent claim 1 and the claims that depend from them are therefore found to be non-statutory subject matter.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless -

- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- 5. Claims 1, 3, 4, 13, 16, 18, 19, 28, 31, 33, 34, 43, 46, 48, 49, 58 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the Bank Marketing International article entitled "Are your customers profitable?"

As per clams 1, 16, 31 and 46, Bank Marketing international's article discloses:

Calculating an individual customer's tenure based on attributes relating to a plurality of current customer accounts, /a calculating module.../means for

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calculating...(page 2, paragraph 6, lines 1-3, paragraph 13, lines 1-2, [customers being grouped/segmented] and identifying the sales of each product by tenure]);

Generating a hazard function for each of a plurality of new customers to determine probability of churn based on the individual customer's tenure, /a generating module.../means for generating...(Page 2, paragraph 14, lines 1-3, [predicting the length of time a customer is likely to stay with it]).

Calculating a gain in lifetime value for each of the plurality of new customers, (Page 2, paragraph 11, lines 1-3, paragraph 12, lines 1-3,/a calculating module/means for calculating... [looking at estimated lifetime value]);

And determining a focus for a loyalty and retention program based on at least one of the hazard function and gain in lifetime value for each of the plurality of new customers,/a determining module.../means for determining...(Page 3, paragraph 2, lines 1-3, paragraph 3, lines 1-3 and page 4, paragraph 5, lines 6-9, [changing the policy]);

As per claims 3, 18, 33 and 48, the Bank Marketing International article discloses:

Analyzing the shape of the hazard function generated for each of the plurality of new customers, (Page 2, paragraph 14, lines 1-2, paragraph 15, lines 1-2, [where the hazard function is represented through the lifetime in the equation]);

And specifying a set of marketing techniques based on the shape of the hazard function...(Page 3, paragraph 2, line 1-3 and paragraph 3, lines 1-3, [where the

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marketing techniques are represented by the bank changing its policy through analysis of the equation]).

As per claims 4, 19, 34 and 49, the Bank Marketing International article discloses:

Specifying a set of incentives offered to the plurality of new customers based on the gain in lifetime value, (Page 4, paragraph 5, lines 6-9, [represented by offering a lower price]).

As per claims 13, 28, 43 and 58, the Bank Marketing International article discloses:

Determining that value of the set of incentives offered to each of the plurality of new customers does not exceed the gain in lifetime value, (page 4, paragraph 5, lines 6-9 [represented by offering a lower price, or dropping a charge by knowing the lifetime value and still making a good return]).

Claim Rejections - 35 USC § 103

- 6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:
 - (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.
- 7. Claims 2, 5, 6, 14, 15,17, 20, 21, 29, 30, 32, 35, 36, 44, 45, 47, 50, 51, 59, 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over by the Bank Marketing International article entitled "Are your customers profitable?", and further in view of

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Sanders (6,411, 936) in further view of Canfield, R. V. "Cost Optimization of periodic preventive maintenance", IEEE Transactions on Reliability".

As per claims 2, 5, 17, 20, 32, 35, 47, 50, Bank Marketing International discloses:

Calculating a lifetime value/calculating the gain in lifetime value...(Page 2, paragraph 11, lines 1-3, paragraph 12, lines 1-3, Page 3, paragraph 10, lines 1-3, Page 4, paragraph 10, lines 1-3, [looking at estimated customer lifetime value, where the value is calculated from attributes such as profitability]);

The Bank Marketing International article fails to disclose the following, however Sanders discloses:

based on contract terms and revenue generated for each of the plurality of new customers/considering a new contract period/determining...there is no effect on churn of a contract expiration, (Col. 11, line 44-Col. 12, line 10, [determining lead generation by using contract value]).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to use the contract terms and revenue to calculate the lifetime value with the motivation of determining which customers are bound to an agreement for specified periods of time and using this information to truly calculate how long a customer will be a customer and how much revenue that customer can pull in for that determined time.

Both the Bank Marketing International article and Sanders fail to disclose the following, however Canfield, R.V. discloses:

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based on the shape of the hazard function, (Abstract, lines 9-20, [represented by results for the shape of the hazard function]).

It would have been obvious to one of ordinary skill at the time of the applicant's invention to base the lifetime value on the shape of the hazard function with the motivation of supplying a visual form for determining this lifetime value information.

As per claims 6, 21, 36, 51, the Bank Marketing International article discloses:

Taking no further steps to deter churn, (Page 2, paragraph 10, line 2, [finding alternative banking arrangements]).

As per claims 14, 15, 29, 30, 44, 45, 59, 60, the Bank Marketing International article fails to disclose the following, however Sanders discloses:

Clustering all of the hazard functions for each of the plurality of new customers so that hazard functions with similar shapes can be grouped together/determining, based on the overall shape of the clustered hazard functions, what retention efforts to take to keep a new customer, (Col. 17, lines 48-52, [represented by clusters of elemental information]).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to cluster all of the hazard functions for each of the plurality of new customers with the motivation of determining the average solution for keeping a customer.

8. Claims 7, 8, 9, 10, 11, 12, 22, 23, 24, 25, 26, 27, 37, 38, 39, 40, 41, 42, 52, 53, 54, 55, 56, 57 are rejected under 35 U.S.C. 103(a) as being unpatentable over by the Bank Marketing International article entitled "Are your customers profitable?", and

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further in view of Canfield, R.V., "Cost Optimization of periodic preventive maintenance", IEEE Transactions on Reliability", and further in view of Sanders (6,411,936).

As per claims 7, 9, 22, 24, 37, 39, 52, 54, the Bank Marketing International article fails to disclose the following, however Canfield, R.V. discloses:

determining, based on the shape of the hazard function, that there is a small increase in probability of churn...with an elevated post-expiration churn, /determining, based on the shape of the hazard function, that there is a large spike indicating high probability of churn...and low probability of churn thereafter, (Abstract, lines 9-20, represented by results for the shape of the hazard function, increase in probability of churn represented by system failure).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to base the lifetime value on the shape of the hazard function with the motivation of supplying a visual form for determining this lifetime value information.

Both Bank Marketing International and Canfield, R.V. fail to disclose the following, however Sanders discloses:

at contract expiration...(Col. 11, lines 44-52, [represented by the size of contracts]).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to have a contract expiration with the motivation of determining how long a customer will be a customer.

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As per claims 8, 10, 11, 12, 23, 38, 25, 26, 27, 40, 41, 42, 53, 55, 57, both Bank Marketing International and Canfield, R.V. fail to disclose the following, however Sanders discloses:

Having a moderate pre-expiration effort where new contracts or continued contracts are the goal/ concentrating effort on pre-expiration of contract where a contract renewal may not be required/having high intensity pre-expiration effort with continued competitive offers to maintain customer/determining, based on the shape of the hazard function, that there is a large increase in probability of churn at expiration with high and increasing post-expiration probability of churn, (Col. 11, line 66-Col. 12, line 6, [represented by yielding to a group of low profit contracts that are listed as a separate category]).

It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to produce new or continued contracts with the motivation of keeping dedicated customers.

Response to Arguments

9. Applicant's arguments filed 9/12/03 have been fully considered but they are not persuasive.

As per claims 1-15, the applicant argues that the 35 U.S.C. 101 rejection. The applicant argues that the two-prong test used in rejecting claims 1-15 is improper. However, the United States Constitution under Art. I, §8, cl. 8 gave Congress the power to "[p]romote the progress of science and useful arts, by securing for limited times to

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authors and inventors the exclusive right to their respective writings and discoveries". In carrying out this power, Congress authorized under 35 U.S.C. §101 a grant of a patent to "[w]hoever invents or discovers any new and useful process, machine, manufacture, or composition or matter, or any new and useful improvement thereof." Therefore, a fundamental premise is that a patent is a statutorily created vehicle for Congress to confer an exclusive right to the inventors for "inventions" that promote the progress of "science and the useful arts". The phrase "technological arts" has been created and used by the courts to offer another view of the term "useful arts". See *In re Musgrave*, 167 USPQ (BNA) 280 (CCPA 1970). Hence, the first test of whether an invention is eliqible for a patent is to determine if the invention is within the "technological arts".

Further, despite the express language of §101, several judicially created exceptions have been established to exclude certain subject matter as being patentable subject matter covered by §101. These exceptions include "laws of nature", "natural phenomena", and "abstract ideas". See *Diamond v. Diehr*, 450, U.S. 175, 185, 209 USPQ (BNA) 1, 7 (1981). However, courts have found that even if an invention incorporates abstract ideas, such as mathematical algorithms, the invention may nevertheless be statutory subject matter if the invention as a whole produces a "useful, concrete and tangible result." See *State Street Bank & Trust Co. v. Signature Financial Group, Inc.* 149 F.3d 1368, 1973, 47 USPQ2d (BNA) 1596 (Fed. Cir. 1998).

This "two prong" test was evident when the Court of Customs and Patent Appeals (CCPA) decided an appeal from the Board of Patent Appeals and Interferences (BPAI). See *In re Toma*, 197 USPQ (BNA) 852 (CCPA 1978). In *Toma*, the court held

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that the recited mathematical algorithm did not render the claim as a whole non-statutory using the Freeman-Walter-Abele test as applied to *Gottschalk v. Benson*, 409 U.S. 63, 175 USPQ (BNA) 673 (1972). Additionally, the court decided separately on the issue of the "technological arts". The court developed a "technological arts" analysis:

The "technological" or "useful" arts inquiry must focus on whether the claimed subject matter...is statutory, not on whether the product of the claimed subject matter...is statutory, not on whether the prior art which the claimed subject matter purports to replace...is statutory, and not on whether the claimed subject matter is presently perceived to be an improvement over the prior art, e.g., whether it "enhances" the operation of a machine. *In re Toma* at 857.

In *Toma*, the claimed invention was a computer program for translating a source human language (e.g., Russian) into a target human language (e.g., English). The court found that the claimed computer implemented process was within the "technological art" because the claimed invention was an operation being performed by a computer within a computer.

The decision in *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*never addressed this prong of the test. In *State Street Bank & Trust Co.*, the court found that the "mathematical exception" using the Freeman-Walter-Abele test has little, if any, application to determining the presence of statutory subject matter but rather, statutory subject matter should be based on whether the operation produces a "useful, concrete and tangible result". See *State Street Bank & Trust Co.* at 1374. Furthermore, the court found that there was no "business method exception" since the court decisions

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that purported to create such exceptions were based on novelty or lack of enablement issues and not on statutory grounds. Therefore, the court held that "[w]hether the patent's claims are too broad to be patentable is not to be judged under §101, but rather under §§102, 103 and 112." See *State Street Bank & Trust Co.* at 1377. Both of these analysis goes towards whether the claimed invention is non-statutory because of the presence of an abstract idea. Indeed, *State Street* abolished the Freeman-Walter-Abele test used in *Toma*. However, State Street never addressed the second part of the analysis, i.e., the "technological arts" test established in *Toma* because the invention in *State Street* (i.e., a computerized system for determining the year-end income, expense, and capital gain or loss for the portfolio) was already determined to be within the technological arts under the *Toma* test. This dichotomy has been recently acknowledged by the Board of Patent Appeals and Interferences (BPAI) in affirming a §101 rejection finding the claimed invention to be non-statutory. See *Ex parte Bowman*, 61 USPQ2d (BNA) 1669 (BdPatApp&Int 2001).

As per claims 2, 17, 32 and 47, the applicant argues that the matter defined by claims 2, 17, 32 and 47 is set forth with a reasonable degree of clarity and particularity. Upon review of the specification, the examiner has decided to withdraw the 35 USC § 112 rejection.

As per claims 1, 3, 4, 13, 16, 18, 19, 28, 31, 33, 34, 43, 46, 48, 49 and 58, the applicant argues that these claims are not anticipated by Bank Marketing and argues that "the length of time a customer is likely to stay with [a] bank" is not consistent with generating a hazard function to determine the probability of a new customer churning or

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determining the probability of a customer's termination of service based on previous behavior. However the length of time a customer is likely to stay with [a] bank in the Bank Marketing International article depends from the tenure data or the sales of each product or service by the customer, which can be defined as the customer's previous behavior. The length of time a customer is likely to stay with [a] bank therefore determines the probability of a customer's termination of service.

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The applicant also argues that the Bank Marketing article fails to teach "calculating a gain in lifetime value for each of the plurality of new customers" and argues that evaluating estimated customer lifetime value (LTV) in the Bank Marketing article is not the same as calculating a gain in lifetime value for each of a plurality of new customers. However, if one evaluates the estimated customer lifetime value and determines that the customer should be kept and developed as shown as one of the options in the bank Marketing article (Paragraph 11, page 2), the result of this evaluation was a gain calculation.

The applicant also argues that the Bank Marketing article fails to disclose determining a focus for loyalty and retention program based on at least one of the hazard function and gain in lifetime value for each of the plurality of new customers, but instead merely discloses building customer profile, applying profitability ratings, and offering lower prices and bundled services to a customer. However when the profitability ratings are applied and analyzed, it leads to an increase in identifiable segment-of-one profits as shown in the bank Marketing article (Page 3, paragraph 3). This increase of profits leads to a determination that the bank's policy should be

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changed to "no fees anytime, anywhere, to anyone" to a more information-driven criteria, which represents the focus for loyalty to customers who bank with that particular bank.

As per independent claims 16, 31 and 46, these claims recite subject matter that parallels subject matter recited in rejected clam 1 and are therefore still rejected for the same reasons as disclosed with respect to claims 16, 31, and 46.

As per claims 3, 4, 13, 18, 19, 28, 33, 34, 43, 48, 49 and 58, these claims depend from rejected claims 1, 16, 31 and 46 and are therefore rejected for the same reasons as disclosed with respect to claims 1, 16, 31 and 46.

In addition, the applicant argues that the Hutton reference does not qualify as prior art since the Hutton reference is an abstract bearing the date of "Dec. 2002". Due to the publication date of Dec. 2002 of Hutton, the examiner has withdrawn the Hutton reference as prior art and has replaced it with the Canfield, R.V. reference.

With regard to claims 2, 17, 32 and 47, the applicant argues that the rejection is ambiguous with respect to Hutton. However, the Hutton reference has been removed from the rejection and replaced with the Canfield, R.V. reference. The arguments made by the applicant are therefore moot.

As per claims 2, 5, 17, 20, 32, 35, 47 and 50, the applicant argues that Sanders fails to cure the deficiencies of Bank Marketing and that there is no motivation for combining Sanders with Bank Marketing. However, Sanders discloses the missing elements of Bank Marketing as described in the rejection. In addition, the combination of Sanders and Bank Marketing is valid since Sanders deals with the generation of

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value enhancement solutions and Bank marketing is directed towards analyzing customer behavior in order to increase profitability. In this case, the increase in profitability is the basis for value enhancement of the bank.

As per claims 5, 20, 35 and 50, the applicant argues that Hutton fails to disclose "based on the shape of the hazard function". However, the Hutton reference has been removed from the rejection and replaced with the Canfield, R.V. reference. The arguments made by the applicant are therefore moot.

As per claims 14, 29, 44 and 59, the applicant argues that both Bank Marketing and Sanders fail to disclose "clustering all of the hazard functions for each of the plurality of new customer so that hazard functions with similar shapes can be grouped together" and "determining, based on the overall shape of the clustered hazard functions, what retention efforts to take to keep a new customer" as recited in claims 15, 30, 45 and 60. However, the combination of Bank Marketing, Sanders, and newly cited reference Canfield discloses these features. First, "clustering all of the hazard functions for each of the plurality of new customer so that hazard functions with similar shapes can be grouped together" is represented in Sanders. Sanders discloses that clusters of elemental information are formed in Col. 17, lines 48-52. When combined with the Canfield reference, the hazard function comes into effect. Canfield discloses that the shape of the hazard function is used to achieve optimization and estimate system failure (performance). Therefore, the Sanders reference shows that it is obvious to cluster information such as hazard function data in order to analyze system performance. In addition, "determining, based on the overall shape of the clustered hazard functions,

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what retention efforts to take to keep a new customer" is disclosed by the combination of Sanders and Canfield. Sanders discloses that the appropriate computations, associations and linkages for performance measures are determined in Col. 17, lines 48-52. These computations of clustered information represent the "determining" step since Sanders shows that the clusters are ultimately used to deliver recommended solutions for value enhancement of an enterprise. In this case, efforts to take to keep a new customer is a form of value enhancement. Also, as described above, in combination with Canfield, the hazard function is incorporated into the solution.

As per claims 7, 9, 22, 24, 37, 39, 52 and 54, the applicant argues that Hutton does not cure the deficiencies of Bank Marketing. However, the Hutton reference has been removed from the rejection and replaced with the Canfield, R.V. reference. The arguments made by the applicant are therefore moot.

As per claims 8, 10-12, 23, 38, 25-27, 40-42, 53, 55 and 57, the applicant argues that there is no motivation to combine Hutton with Sanders and Bank Marketing.

However, the Hutton reference has been removed from the rejection and replaced with the Canfield, R.V. reference. The arguments made by the applicant are therefore moot.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Akiba K Robinson-Boyce whose telephone number is 703-305-1340. The examiner can normally be reached on Monday-Friday 8:30am-5pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tariq Hafiz can be reached on 703-305-9643. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7238 [After final communications, labeled "Box AF"], 703-746-7239 [Official Communications], and 703-746-7150 [Informal/Draft Communications, labeled "PROPOSED" or "DRAFT"].

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

A. R. B. November 20, 2003

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